NEUROSCIENCE

Volume 63, 1994

TITLE SECTION
LIST OF CONTENTS
AND AUTHOR INDEX

PERGAMON

NEUROSCIENCE

Chief Editors

P. G. KOSTYUK: *Department of General Physiology, A. A. Bogomoletz Institute of Physiology, Academy of Sciences, 4 Bogomoletz Street, Kiev 24, 252601 GSP, Ukraine*

R. LLINÁS: *Department of Physiology and Biophysics, New York University School of Medicine, 550 First Avenue, New York 10016, U.S.A.*

A. D. SMITH: *Department of Pharmacology, University of Oxford, Mansfield Road, Oxford OX1 3QT, U.K.*

Editorial Board

G. ASTON-JONES (*Philadelphia, PA*)
A. BJÖRKLUND (*Lund*)
A. BLIGHT (*Chapel Hill, NA*)
T. V. P. BLISS (*London*)
J. P. BOLAM (*Oxford*)
A. G. BROWN (*Edinburgh*)
M. C. BROWN (*Oxford*)
J. BUREŠ (*Prague*)
G. BUZSÁKI (*Newark, NJ*)
A. L. BYSOV (*Moscow*)
D. W. CHOI (*St Louis, MO*)
A. CONSTANTI (*London*)
M. COSTA (*Adelaide*)
J. T. COYLE (*Belmont, MA*)
W. CRILL (*Seattle, WA*)
A. C. CUELLO (*Montreal*)
A. C. DOLPHIN (*London*)
F. E. DUDEK (*Fort Collins, CO*)
A. W. DUGGAN (*Edinburgh*)
S. B. DUNNETT (*Cambridge*)
D. EDGAR (*Liverpool*)
M. M. ESIRI (*Oxford*)
R. H. EVANS (*Bristol*)
D. S. FABER (*Philadelphia, PA*)
V. V. FANARDJIAN (*Yerevan*)
R. L. M. FAULL (*Auckland*)
R. FISCHER-COLBRIE (*Innsbruck*)
T. F. FREUND (*Budapest*)
G. GABELLA (*London*)
F. H. GAGE (*La Jolla, CA*)
J. GARTHWAITE (*Beckenham*)
C. R. GERFEN (*Bethesda, MD*)
H. M. GERSCHENFELD (*Paris*)
J. GLOWINSKI (*Paris*)
J. A. GRAY (*London*)
A. M. GRAYBIEL (*Cambridge, MA*)
H. J. GROENEWEGEN (*Amsterdam*)
R. W. GUILLERY (*Oxford*)
M. HAMON (*Paris*)
F. F. HEFTI (*South San Francisco, CA*)
L. HEIMER (*Charlottesville, VA*)
Z. HENDERSON (*Leeds*)
J. HERBERT (*Cambridge*)
M. HERKENHAM (*Bethesda, MD*)
D. E. HILLMAN (*New York, NY*)
T. HÖKFELT (*Stockholm*)
P. HOLZER (*Graz*)
O. HORNYKIEWICZ (*Vienna*)
J. HOUNSGAARD (*Copenhagen*)
S. P. HUNT (*Cambridge*)
H. JAHNSEN (*Copenhagen*)
B. E. JONES (*Montreal*)
E. G. JONES (*Irvine, CA*)
G. JU (*Xi'an*)
J. S. KELLY (*Edinburgh*)
B. I. KHODOROV (*Moscow*)
S. T. KITAI (*Memphis, TN*)
C. KÖHLER (*Basel*)
T. KOSAKA (*Fukuoka*)
O. A. KRISHTAL (*Kiev*)
S. N. LAWSON (*Bristol*)
J. D. LEVINE (*San Francisco, CA*)
C. A. MARSDEN (*Nottingham*)
M. R. MATTHEWS (*Oxford*)
A. I. MATUS (*Basle*)
J. F. MORRIS (*Oxford*)
É. MUGNAINI (*Storrs, CT*)
T. ONO (*Toyama*)
F. ORREGO (*Santiago*)
J. M. PALACIOS (*Barcelona*)
S. L. PALAY (*Concord, MA*)
V. H. PERRY (*Oxford*)
J. M. POLAK (*London*)
P. RAKIC (*New Haven, CA*)
H. J. RALSTON (*San Francisco, CA*)
S. J. REDMAN (*Canberra*)
T. S. REESE (*Bethesda, MD*)
F. REINOSO-SUÁREZ (*Madrid*)
L. P. RENAUD (*Ottawa*)
M. RÉTHELYI (*Budapest*)
P. J. ROBERTS (*Bristol*)
H. A. ROBERTSON (*Halifax, N.S.*)
S. M. SHERMAN (*Stony Brook, NY*)
M. L. SHIK (*Moscow*)
S. SNYDER (*Baltimore, MD*)
M. V. SOFRONIEW (*Cambridge*)
P. SOMOGYI (*Oxford*)
C. SOTELO (*Paris*)
K. STARKE (*Freiburg*)
M. S. STARR (*London*)
M. STERIADE (*Québec*)
L. STJÄRNE (*Stockholm*)
K. SUZUKI (*Chapel Hill, NC*)
D. T. THEODOSIS (*Bordeaux*)
A. M. THOMSON (*London*)
K. UNSICKER (*Heidelberg*)
S. R. VINCENT (*Vancouver*)
J. VOOGD (*Rotterdam*)
L. VYKLICKY (*Prague*)
K. D. WALTON (*New York, NY*)
X. S. T. WAN (*Beijing*)
K. WICTORIN (*Lund*)
W. D. WILLIS (*Galveston, TX*)
H. WINKLER (*Innsbruck*)
D. J. WOODWARD (*Winston-Salem, NC*)
H. ZIMMERMANN (*Frankfurt*)
C. ZUCKER (*Boston, MA*)

IBRO Publications Committee

Chairman, A. D. SMITH; C. BLAKEMORE, R. LLINÁS, D. G. R. OTTOSON, D. P. PURPURA, P. G. STRATA.

Production Editors: M. DAVIES, J. M. WALL. *Editorial Assistants*: S. J. RUSSELL (U.K.), P. BLAIKIE (U.S.).

Published 24 per annum, semi-monthly (six volumes, 1994)

Publishing, Subscription and Advertising Offices:

The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, U.K. [*Tel*: (01865) 843000; *Fax*: (01865) 843010]

Subscription Rates

Annual institutional subscription rate (1995) *North, Central and South America, U.S.*$3487; *Rest of World*, £2340. *Associated Personal Subscription Rates are available on request for those whose institutions are library subscribers. Sterling prices exclude VAT. Non-VAT registered customers in the European Community will be charged the appropriate VAT in addition to the price listed. Prices include postage and insurance and are subject to change without notice. Members of the International Brain Research Organization may order personal subscriptions at a concessional rate and details of these rates are available on request. Airmail Subscription extra. Subscription enquiries from customers in North America should be sent to: Elsevier Science Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A., and for the remainder of the world to: Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, U.K. Tel*: (01865) 843000; *Fax*: (01865) 843010.

Disclaimer. Whilst every effort is made by the Publishers and Editorial Board to see that no inaccurate or misleading data, opinion or statement appear in this Journal, they wish to make it clear that the data and opinions appearing in the articles and advertisements herein are the sole responsibility of the contributor or advertiser concerned. Accordingly, the Publishers, the Editorial Board and Editors and their respective employees, officers and agents accept no responsibility or liability whatsoever for the consequences of any such inaccurate or misleading data, opinion or statement.

Second class postage paid at Newark, NJ, and additional Mailing Offices. Postmaster send address corrections to *Neuroscience*, c/o Elsevier Science Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A.

Copyright © 1994 IBRO

Front cover illustration: Section of a nerve in the spinal cord of the ox, reproduced by permission of the Bodleian Library, Oxford from Antoni van Leeuwenhoek, *Epistolae physiologicae super compluribus naturae arcanis*, Figure 2 facing page 312. A. Beman, Delft, 1719.

LIST OF CONTENTS

VOLUME 63 NUMBER 1 — 1994

LETTER TO NEUROSCIENCE

I. J. Mitchell, S. Lawson, B. Moser, S. M. Laidlaw, A. J. Cooper, G. Walkinshaw and C. M. Waters — Glutamate-induced apoptosis results in a loss of striatal neurons in the parkinsonian rat — 1

RESEARCH PAPERS

H. Pollard, C. Charriaut-Marlangue, S. Cantagrel, A. Represa, O. Robain, J. Moreau and Y. Ben-Ari — Kainate-induced apoptotic cell death in hippocampal neurons — 7

H. Jeltsch, J. C. Cassel, B. Neufang, C. Kelche, G. Hertting, R. Jackisch and B. Will — The effects of intrahippocampal raphe and/or septal grafts in rats with fimbria–fornix lesions depend on the origin of the grafted tissue and the behavioural task used — 19

H. Jeltsch, J. C. Cassel, S. Simler, C. Lazarus, C. Kelche, G. Hertting, R. Jackisch and B. Will — Hippocampal amino acid concentrations after raphe and/or septal cell suspension grafts in rats with fimbria–fornix lesions — 41

M. Varastet, D. Riche, M. Maziere and P. Hantraye — Chronic MPTP treatment reproduces in baboons the differential vulnerability of mesencephalic dopaminergic neurons observed in Parkinson's disease — 47

G. Nikkhah, M. Olsson, J. Eberhard, C. Bentlage, M. G. Cunningham and A. Björklund — A microtransplantation approach for cell suspension grafting in the rat Parkinson model: a detailed account of the methodology — 57

H. Moukhles, M. Amalric, A. Nieoullon and A. Daszuta — Behavioural recovery of rats grafted with dopamine cells after partial striatal dopaminergic depletion in a conditioned reaction-time task — 73

R. L. Hakan, C. Eyl and S. J. Henriksen — Neuropharmacology of the nucleus accumbens: systemic morphine effects on single-unit responses evoked by ventral pallidum stimulation — 85

E. M. Torres, T. A. Perry, A. Blokland, L. S. Wilkinson, R. G. Wiley, D. A. Lappi and S. B. Dunnett — Behavioural, histochemical and biochemical consequences of selective immunolesions in discrete regions of the basal forebrain cholinergic system — 95

S. Davanger, R. Torp and O. P. Ottersen — Co-localization of glutamate and homocysteic acid immunoreactivities in human photoreceptor terminals — 123

K. Borges, C. Ohlemeyer, J. Trotter and H. Kettenmann — AMPA/kainate receptor activation in murine oligodendrocyte precursor cells leads to activation of a cation conductance, calcium influx and blockade of delayed rectifying K^+ channels — 135

Y. Amitai — Membrane potential oscillations underlying firing patterns in neocortical neurons — 151

V. Taylor, G. C. Miescher, S. Pfarr, P. Honegger, H. Breitschopf, H. Lassmann and A. J. Steck — Expression and developmental regulation of Ehk-1, a neuronal Elk-like receptor tyrosine kinase in brain — 163

W. W.-G. Jia, Y. Liu, F. Lepore, M. Ptito and M. Cynader — Development and regulation of alpha adrenoceptors in kitten visual cortex — 179

K. A. Manning, T. P. Pienkowski and D. J. Uhlrich — Histaminergic and non-histamine-immunoreactive mast cells within the cat lateral geniculate complex examined with light and electron microscopy — 191

A. I. Levey, S. M. Edmunds, C. J. Heilman, T. J. Desmond and **K. A. Frey**	Localization of muscarinic m3 receptor protein and M3 receptor binding in rat brain	207
S. R. Vincent, S. Das and **M. D. Maines**	Brain heme oxygenase isoenzymes and nitric oxide synthase are co-localized in select neurons	223
E. Ekblad, P. Alm and **F. Sundler**	Distribution, origin and projections of nitric oxide synthase-containing neurons in gut and pancreas	233
T. Fink, P. Di Sebastiano, M. Büchler, H. G. Beger and **E. Weihe**	Growth-associated protein-43 and protein gene-product 9.5 innervation in human pancreas: changes in chronic pancreatitis	249
R. K. W. Chan, Y. S. Chan and **T. M. Wong**	Effects of [Sar^1, Ile^8]-angiotensin II on rostral ventrolateral medulla neurons and blood pressure in spontaneously hypertensive rats	267
M. M. Heinricher, M. M. Morgan, V. Tortorici and **H. L. Fields**	Disinhibition of off-cells and antinociception produced by an opioid action within the rostral ventromedial medulla	279
B. H. Manning, M. J. Morgan and **K. B. J. Franklin**	Morphine analgesia in the formalin test: evidence for forebrain and midbrain sites of action	289
F. Zheng and **S. N. Lawson**	Immunocytochemical properties of rat renal afferent neurons in dorsal root ganglia: a quantitative study	295
H. Mulder, R. Uddman, K. Moller, Y.-Z. Zhang, E. Ekblad, J. Alumets and **F. Sundler**	Pituitary adenylate cyclase activating polypeptide expression in sensory neurons	307
S. Persson, M. K.-H. Schäfer, D. Nohr, G. Ekström, C. Post, F. Nyberg and **E. Weihe**	Spinal prodynorphin gene expression in collagen-induced arthritis: influence of the glucocorticosteroid budesonide	313
A. L. Connold and **G. Vrbová**	Neuromuscular contacts of expanded motor units in rat soleus muscles are rescued by leupeptin	327
M. Ljubisavljević and **R. Anastasijević**	Fusimotor-induced changes in muscle spindle outflow and responsiveness in muscle fatigue in decerebrate cats	339
CORRIGENDUM		349

VOLUME 63 NUMBER 2 1994

LETTERS TO NEUROSCIENCE

I. Dusart, M. P. Morel and **C. Sotelo**	Parasagittal compartmentation of adult rat Purkinje cells expressing the low-affinity nerve growth factor receptor: changes of pattern expression after a traumatic lesion	351
Y. L. Hurd, Z. B. Pristupa, M. M. Herman, H. B. Niznik and **J. E. Kleinman**	The dopamine transporter and dopamine D_2 receptor messenger RNAs are differentially expressed in limbic- and motor-related subpopulations of human mesencephalic neurons	357

COMMENTARIES

D. Joel and **I. Weiner**	The organization of the basal ganglia–thalamocortical circuits: open interconnected rather than closed segregated	363
P. Kostyuk and **A. Verkhratsky**	Calcium stores in neurons and glia	381

RESEARCH PAPERS

P. Fossier, G. Baux and **L. Tauc**	Presynaptic mechanisms regulating Ca^{2+} concentration triggering acetylcholine release at an identified neuro-neuronal synapse of *Aplysia*	405
Z.-B. You, I. Nylander, M. Herrera-Marschitz, W. T. O'Connor, M. Goiny and **L. Terenius**	The striatonigral dynorphin pathway of the rat studied with *in vivo* microdialysis—I. Effects of K^+-depolarization, lesions and peptidase inhibition	415
Z.-B. You, M. Herrera-Marschitz, I. Nylander, M. Goiny, W. T. O'Connor, U. Ungerstedt and **L. Terenius**	The striatonigral dynorphin pathway of the rat studied with *in vivo* microdialysis—II. Effects of dopamine D_1 and D_2 receptor agonists	427
L. K. Nisenbaum, S. T. Kitai and **C. R. Gerfen**	Dopaminergic and muscarinic regulation of striatal enkephalin and substance P messenger RNAs following striatal dopamine denervation: effects of systemic and central administration of quinpirole and scopolamine	435
R. Dall'Olio, F. Facchinetti, A. Contestabile and **O. Gandolfi**	Chronic neonatal blockade of *N*-methyl-D-aspartate receptor by CGP 39551 increases dopaminergic function in adult rat	451
J. C. Leahy, Q. Chen and **M. L. Vallano**	Chronic mild acidosis specifically reduces functional expression of *N*-methyl-D-aspartate receptors and increases long-term survival in primary cultures of cerebellar granule cells	457
L. D. Pozzo Miller, N. K. Mahanty, J. A. Connor and **D. M. D. Landis**	Spontaneous pyramidal cell death in organotypic slice cultures from rat hippocampus is prevented by glutamate receptor antagonists	471
P. J. Zhu and **K. Krnjević**	Endogenous adenosine deaminase does not modulate synaptic transmission in rat hippocampal slices under normoxic or hypoxic conditions	489
M. Holzer, H.-P. Holzapfel, D. Zedlick, M. K. Brückner and **T. Arendt**	Abnormally phosphorylated tau protein in Alzheimer's disease: heterogeneity of individual regional distribution and relationship to clinical severity	499
C. J. Pike, B. J. Cummings, R. Monzavi and **C. W. Cotman**	β-Amyloid-induced changes in cultured astrocytes parallel reactive astrocytosis associated with senile plaques in Alzheimer's disease	517
M. M. Heinricher and **V. Tortorici**	Interference with GABA transmission in the rostral ventromedial medulla: disinhibition of off-cells as a central mechanism in nociceptive modulation	533
D. L. Voisin, C. Chapman, D. A. Poulain and **A. E. Herbison**	Extracellular GABA concentrations in rat supraoptic nucleus during lactation and following haemodynamic changes: an *in vivo* microdialysis study	547
F. Gonzalez-Lima and **A. Cada**	Cytochrome oxidase activity in the auditory system of the mouse: a qualitative and quantitative histochemical study	559
C. R. Breese, A. D'Costa and **W. E. Sonntag**	Effect of *in utero* ethanol exposure on the postnatal ontogeny of insulin-like growth factor-1, and type-1 and type-2 insulin-like growth factor receptors in the rat brain	579
R. L. Meyer, J. A. Miotke and **L. I. Benowitz**	Injury induced expression of growth-associated protein-43 in adult mouse retinal ganglion cells *in vitro*	591

M. Beltramo, A. Calas, E. Chernigovskaya, N. Borisova, O. Polenova, Y. Tillet, J. Thibault and **M. Ugrumov** — Postnatal development of the suprachiasmatic nucleus in the rat. Morpho-functional characteristics and time course of tyrosine hydroxylase immunopositive fibers — 603

Yu. S. Mednikova and **F. V. Kopytova** — Some physiological characteristics of motor cortex neurons of aged rabbits — 611

H. Zhuo, C. Sinclair and **C. J. Helke** — Plasticity of tyrosine hydroxylase and vasoactive intestinal peptide messenger RNAs in visceral afferent neurons of the nodose ganglion upon axotomy-induced deafferentation — 617

ERRATUM — 627

VOLUME 63 NUMBER 3 — 1994

LETTER TO NEUROSCIENCE

J. M. Luque, Z. Bleuel, P. Malherbe and **J. G. Richards** — Alternatively spliced isoforms of the *N*-methyl-D-aspartate receptor subunit 1 are differentially distributed within the rat spinal cord — 629

RESEARCH PAPERS

T. M. Westlake, A. C. Howlett, T. I. Bonner, L. A. Matsuda and **M. Herkenham** — Cannabinoid receptor binding and messenger RNA expression in human brain: an *in vitro* receptor autoradiography and *in situ* hybridization histochemistry study of normal aged and Alzheimer's brains — 637

R. M. Ridley, J. A. Baker, H. F. Baker and **C. J. Maclean** — Restoration of cognitive abilities by cholinergic grafts in cortex of monkeys with lesions of the basal nucleus of Meynert — 653

M. Collery, J. Delacour and **M. Jousselin-Hosaja** — Cholinergic differentiation factor/leukemia inhibitory factor enhances functional effects of adrenal medulla grafts after hippocampal lesions in rats — 667

M. Endoh, K. Maiese and **J. A. Wagner** — Expression of the neural form of nitric oxide synthase by CA1 hippocampal neurons and other central nervous system neurons — 679

S. Okuda, H. Saito and **H. Katsuki** — Arachidonic acid: toxic and trophic effects on cultured hippocampal neurons — 691

D. E. Pellegrini-Giampietro, A. Cozzi and **F. Moroni** — The glycine antagonist and free radical scavenger 7-Cl-thio-kynurenate reduces CA1 ischemic damage in the gerbil — 701

S. F. Sawyer, S. J. Young, P. M. Groves and **J. M. Tepper** — Cerebellar-responsive neurons in the thalamic ventroanterior–ventrolateral complex of rats: *in vivo* electrophysiology — 711

S. F. Sawyer, J. M. Tepper and **P. M. Groves** — Cerebellar-responsive neurons in the thalamic ventroanterior–ventrolateral complex of rats: light and electron microscopy — 725

G. Boorman, U. Windhorst and **D. Kirmayer** — Waveform parameters of recurrent inhibitory postsynaptic potentials in cat motoneurons during time-varying activation patterns — 747

N. B. Mercuri, A. Bonci, P. Calabresi, F. Stratta and **G. Bernardi** — Responses of rat mesencephalic dopaminergic neurons to a prolonged period of oxygen deprivation — 757

S. Ferré, W. T. O'Connor, P. Snaprud, U. Ungerstedt and **K. Fuxe** — Antagonistic interaction between adenosine A_{2A} receptors and dopamine D_2 receptors in the ventral striopallidal system. Implications for the treatment of schizophrenia — 765

M. D. Johnson	Electrophysiological and histochemical properties of postnatal rat serotonergic neurons in dissociated cell culture	775
T. Gemba, T. Oshima and **M. Ninomiya**	Glutamate efflux via the reversal of the sodium-dependent glutamate transporter caused by glycolytic inhibition in rat cultured astrocytes	789
R. Spanagel and **M. Shoaib**	Involvement of mesolimbic κ-opioid systems in the discriminative stimulus effects of morphine	797
A. J. Todd, R. C. Spike, A. R. Brodbelt, R. F. Price and **S. A. S. Shehab**	Some inhibitory neurons in the spinal cord develop c-fos-immunoreactivity after noxious stimulation	805
X.-J. Xu, J.-X. Hao, T. Hökfelt and **Z. Wiesenfeld-Hallin**	The effects of intrathecal neuropeptide Y on the spinal nociceptive flexor reflex in rats with intact sciatic nerves and after peripheral axotomy	817
Y. Hong and **F. V. Abbott**	Behavioural effects of intraplantar injection of inflammatory mediators in the rat	827
J.-Y. Li, R. Jahn and **A. Dahlström**	Synaptotagmin I is present mainly in autonomic and sensory neurons of the rat peripheral nervous system	837
B. Planas, P. E. Kolb, M. A. Raskind and **M. A. Miller**	Activation of galanin pathways across puberty in the male rat: galanin gene expression in the bed nucleus of the stria terminalis and medial amygdala	851
B. Planas, P. E. Kolb, M. A. Raskind and **M. A. Miller**	Activation of galanin pathways across puberty in the male rat: assessment of regional densities of galanin binding sites	859
D. Brown, A. E. Herbison, J. E. Robinson, R. W. Marrs and **G. Leng**	Modelling the luteinizing hormone-releasing hormone pulse generator	869
C. M. Waters, W. Moser, G. Walkinshaw and **I. J. Mitchell**	Death of neurons in the neonatal rodent and primate globus pallidus occurs by a mechanism of apoptosis	881
J.-P. Brion, J. N. Octave and **A. M. Couck**	Distribution of the phosphorylated microtubule-associated protein tau in developing cortical neurons	895

VOLUME 63 NUMBER 4 1994

LETTER TO NEUROSCIENCE

A. M. Batchelor, D. J. Madge and **J. Garthwaite**	Synaptic activation of metabotropic glutamate receptors in the parallel fibre-Purkinje cell pathway in rat cerebellar slices	911

RESEARCH PAPERS

M. L. Hooper, B. J. Chiasson and **H. A. Robertson**	Infusion into the brain of an antisense oligonucleotide to the immediate-early gene *c-fos* suppresses production of Fos and produces a behavioral effect	917
R. Kolhekar, S. T. Meller and **G. F. Gebhart**	*N*-methyl-D-aspartate receptor-mediated changes in thermal nociception: allosteric modulation at glycine and polyamine recognition sites	925
D. S. F. Ling and **L. S. Benardo**	Properties of isolated $GABA_B$-mediated inhibitory postsynaptic currents in hippocampal pyramidal cells	937
P. S. Whitton, S. Maione, C. S. Biggs and **L. J. Fowler**	Tonic desensitization of hippocampal α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptors regulates 5-hydroxytryptamine release *in vivo*	945

A. S. Rosen and **M. E. Morris**	Influence of temperature on anoxic responses of neocortical pyramidal neurons	949
H. Tomimoto and **T. Yanagihara**	Golgi electron microscopic study of the cerebral cortex after transient cerebral ischemia and reperfusion in the gerbil	957
S. A. Rabacchi, M. Ensini, L. Bonfanti, A. Gravina and **L. Maffei**	Nerve growth factor reduces apoptosis of axotomized retinal ganglion cells in the neonatal rat	969
G. Walkinshaw and **C. M. Waters**	Neurotoxin-induced cell death in neuronal PC12 cells is mediated by induction of apoptosis	975
N. Kayadjanian, H. Gioanni, A. Ménetrey and **M. J. Besson**	Muscarinic receptor stimulation increases the spontaneous [^{3}H]GABA release in the rat substantia nigra through muscarinic receptors localized on striatonigral terminals	989
A. E. Johnson, U. Liminga, A. Lidén, N. Lindefors, L. M. Gunne and **F. -A. Wiesel**	Chronic treatment with a classical neuroleptic alters excitatory amino acid and GABAergic neurotransmission in specific regions of the rat brain	1003
Y. Koyama, E. Jodo and **Y. Kayama**	Sensory responsiveness of "broad-spike" neurons in the laterodorsal tegmental nucleus, locus coeruleus and dorsal raphe of awake rats: implications for cholinergic and monoaminergic neuron-specific responses	1021
M. Tallent, M. A. Dichter, G. I. Bell and **T. Reisine**	The cloned kappa opioid receptor couples to an N-type calcium current in undifferentiated PC-12 cells	1033
R. J. Pearce and **M. R. Duchen**	Differential expression of membrane currents in dissociated mouse primary sensory neurons	1041
E. Hansson, B. B. Johansson, I. Westergren and **L. Rönnbäck**	Glutamate-induced swelling of single astroglial cells in primary culture	1057
D. Leifer, J. Golden and **N. W. Kowall**	Myocyte-specific enhancer binding factor 2C expression in human brain development	1067
G. V. Ronnett, L. D. Hester, J. S. Nye and **S. H. Snyder**	Human cerebral cortical cell lines from patients with unilaterial megalencephaly and Rasmussen's encephalitis	1081
K. Ohno, T. Kitahara, N. Takeda, T. Kubo and **H. Kiyama**	Gene regulation of cyclic AMP-dependent protein kinase subunits (Cα, β; RIα, β and RIIα, β) in rat facial motoneurons after nerve transection	1101
B. Przewlocka, W. Lasoń and **R. Przewlocki**	The effect of chronic morphine and cocaine administration on the Gs and Go protein messenger RNA levels in the rat hippocampus	1111
R. Wetts and **J. E. Vaughn**	Choline acetyltransferase and NADPH diaphorase are co-expressed in rat spinal cord neurons	1117
J. C. V. M. Copray and **N. Brouwer**	Selective expression of neurotrophin-3 messenger RNA in muscle spindles of the rat	1125
C. A. Maggi, V. Zagorodnyuk and **S. Giuliani**	Specialization of tachykinin NK_1 and NK_2 receptors in producing fast and slow atropine-resistant neurotransmission to the circular muscle of the guinea-pig colon	1137
Z.-M. Song, S. J. H. Brookes and **M. Costa**	Characterization of alkaline phosphatase-reactive neurons in the guinea-pig small intestine	1153

J. Lu, C. Kaur and **E.-A. Ling**	Up-regulation of surface antigens on epiplexus cells in postnatal rats following intraperitoneal injections of lipopolysaccharide	1169
R. Kirchmair, A. Benzer, J. Troger, C. Miller, J. Marksteiner, A. Saria, R. W. Gasser, R. Hogue-Angeletti, R. Fischer-Colbrie and **H. Winkler**	Molecular characterization of immunoreactivities of peptides derived from chromogranin A (GE-25) and from secretogranin II (secretoneurin) in human and bovine cerebrospinal fluid	1179
K. Krieglstein and **K. Unsicker**	Transforming growth factor-β promotes survival of midbrain dopaminergic neurons and protects them against *N*-methyl-4-phenylpyridinium ion toxicity	1189
BOOK REVIEW		
A. D. Smith	*Alzheimer Disease*. Edited by R. D. Terry, R. Katzman and K. Bick	1197

AUTHOR INDEX

Abbott F. V., 827
Alm P., 233
Alumets J., 307
Amalric M., 73
Amitai Y., 151
Anastasijević R., 349
Arendt T., 499

Baker H. F., 653
Baker J. A., 653
Batchelor A. M., 911
Baux G., 405
Beger H. G., 249
Bell G. I., 1033
Beltramo M., 603
Ben-Ari Y., 7
Benardo L. S., 937
Benowitz L. I., 591
Bentlage C., 57
Benzer A., 1179
Bernardi G., 757
Besson M. J., 989
Biggs C. S., 945
Björklund A., 57
Bleuel Z., 629
Blokland A., 95
Bonci A., 757
Bonfanti L., 969
Bonner T. I., 637
Boorman G., 747
Borges K., 135
Borisova N., 603
Breese C. R., 579
Breitschopf H., 163
Brion J.-P., 895
Brodbelt A. R., 805
Brookes S. J. H., 1153
Brouwer N., 1125
Brown D., 869
Brückner M. K., 499
Büchler M., 249

Cada A., 558
Calabresi P., 757
Calas A., 603
Cantagrel S., 7
Cassel J. C., 19, 41
Chan R. K. W., 267
Chan Y. S., 267
Chapman C., 547
Charriaut-Marlangue C., 7
Chen Q., 457
Chernigovskaya E., 603
Chiasson B. J., 917
Collery M., 667
Connold A. L., 327
Connor J. A., 471
Contestabile A., 451
Cooper A. J., 1
Copray J. C. V. M., 1125
Costa M., 1153
Cotman C. W., 517
Couck A. M., 895
Cozzi A., 701
Cummings B. J., 517
Cunningham M. G., 57
Cynader M., 179

D'costa A., 579
Dahlström A., 837
Dall'olio R., 451
Das S., 223
Daszuta A., 73
Davanger S., 123
Delacour J., 667
Desmond T. J., 207
Dichter M. A., 1033
Duchen M. R., 1041
Dunnett S. B., 95
Dusart I., 351

Eberhard J., 57
Edmunds S. M., 207
Ekblad E., 233, 307
Ekström G., 313
Endoh M., 679
Ensini M., 969
Eyl C., 85

Facchinetti F., 451
Ferré S., 765
Fields H. L., 279
Fink T., 249
Fischer-Colbrie R., 1179
Fossier P., 405
Fowler L. J., 945
Franklin K. B. J., 289
Frey K. A., 207
Fuxe K., 765

Gandolfi O., 451
Garthwaite J., 911
Gasser R. W., 1179
Gebhart G. F., 925
Gemba T., 789
Gerfen C. R., 435
Gioanni H., 989
Giuliani S., 1137
Goiny M., 415, 427
Golden J., 1067
Gonzalez-Lima F., 558
Gravina A., 969
Groves P. M., 711, 725
Gunne L. M., 1003

Hakan R. L., 85
Hansson E., 1057
Hantraye P., 47
Hao J.-X., 817
Heilman C. J., 207
Heinricher M. M., 279, 533
Helke C. J., 617
Henriksen S. J., 85
Herbison A. E., 547, 869
Herkenham M., 637
Herman M. M., 357
Herrera-Marschitz M., 415, 427
Hertting G., 19, 41
Hester L. D., 1081
Hogue-Angeletti R., 1179
Hökfelt T., 817
Holzapfel H.-P., 499
Holzer M., 499
Honegger P., 163
Hong Y., 827
Hooper M. L., 917
Howlett A. C., 637
Hurd Y. L., 357

Jackisch R., 19, 41
Jahn R., 837
Jeltsch H., 19, 41
Jia W. W.-G., 179
Jodo E., 1021
Joel D., 363
Johansson B. B., 1057
Johnson A. E., 1003
Johnson M. D., 775
Jousselin-Hosaja M., 667

Katsuki H., 691
Kaur C., 1169
Kayadjanian N., 989
Kayama Y., 1021
Kelche C., 19, 41
Kettenmann H., 135
Kirchmair R., 1179
Kirmayer D., 747
Kitahara T., 1101
Kitai S. T., 435
Kiyama H., 1101
Kleinman J. E., 357
Kolb P. E., 851, 859
Kolhekar R., 925
Kopytova F. V., 611
Kostyuk P., 381
Kowall N. W., 1067
Koyama Y., 1021
Krieglstein K., 1189
Krnjević K., 489
Kubo T., 1101

Laidlaw S. M., 1
Landis D. M. D., 471
Lappi D. A., 95
Lasoń W., 1111
Lassmann H., 163
Lawson S., 1
Lawson S. N., 295
Lazarus C., 41
Leahy J. C., 457
Leifer D., 1067
Leng G., 869
Lepore F., 179
Levey A. I., 207
Li J.-Y., 837
Lidén A., 1003
Liminga U., 1003
Lindefors N., 1003
Ling D. S. F., 937
Ling E.-A., 1169
Liu Y., 179
Ljubisavljević M., 349
Lu J., 1169
Luque J. M., 629

Maclean C. J., 653
Madge D. J., 911
Maffei L., 969
Maggi C. A., 1137
Mahanty N. K., 471
Maiese K., 679
Maines M. D., 223
Maione S., 945
Malherbe P., 629

Manning B. H., 289
Manning K. A., 191
Marksteiner J., 1179
Marrs R. W., 869
Matsuda L. A., 637
Maziere M., 47
Mednikova Yu. S., 611
Meller S. T., 925
Ménetrey A., 989
Mercuri N. B., 757
Miescher G. C., 163
Miller C., 1179
Miller L. D. P., 471
Miller M. A., 851, 859
Miotke R. L. M. J. A., 591
Mitchell I. J., 1, 881
Moller K., 307
Monzavi R., 517
Moreau J., 7
Morel M. P., 351
Morgan M. J., 289
Morgan M. M., 279
Moroni F., 701
Morris M. E., 949
Moser B., 1
Moser W., 881
Moukhles H., 73
Mulder H., 307

Neufang B., 19
Nieoullon A., 73
Nikkhah G., 57
Ninomiya M., 789
Nisenbaum L. K., 435
Niznik H. B., 357
Nohr D., 313
Nyberg F., 313
Nye J. S., 1081
Nylander I., 415, 427

O'Connor W. T., 415, 427, 765
Octave J. N., 895
Ohlemeyer C., 135
Ohno K., 1101
Okuda S., 691
Olsson M., 57
Oshima T., 789
Ottersen O. P., 123

Pearce R. J., 1041
Pellegrini-Giampietro D. E., 701
Perry T. A., 95
Persson S., 313
Pfarr S., 163
Pienkowski T. P., 191
Pike C. J., 517
Planas B., 851, 859
Polenova O., 603
Pollard H., 7
Post C., 313
Poulain D. A., 547
Price R. F., 805
Pristupa Z. B., 357
Przewłocka B., 1111
Przewłocki R., 1111
Ptito M., 179

Rabacchi S. A., 969
Raskind M. A., 851, 859
Reisine T., 1033
Represa A., 7
Richards J. G., 629
Riche D., 47
Ridley R. M., 653
Robain O., 7
Robertson H. A., 917
Robinson J. E., 869
Rönnbäck L., 1057
Ronnett G. V., 1081
Rosen A. S., 949

Saito H., 691
Saria A., 1179
Sawyer S. F., 711, 725
Schäfer M. K.-H., 313
Sebastiano P. D., 249
Shehab S. A. S., 805
Shoaib M., 797
Simler S., 41
Sinclair C., 617
Smith A. D., 1197
Snaprud P., 765
Snyder S. H., 1081
Song Z.-M., 1153
Sonntag W. E., 579
Sotelo C., 351
Spanagel R., 797
Spike R. C., 805
Steck A. J., 163
Stratta F., 757
Sundler F., 233, 307

Takeda N., 1101
Tallent M., 1033
Tauc L., 405
Taylor V., 163
Tepper J. M., 711, 725
Terenius L., 415, 427
Thibault J., 603
Tillet Y., 603
Todd A. J., 805
Tomimoto H., 957
Torp R., 123
Torres E. M., 95
Tortorici V., 279, 533
Troger J., 1179
Trotter J., 135

Uddman R., 307
Ugrumov M., 603
Uhlrich D. J., 191
Ungerstedt U., 427, 765
Unsicker K., 1189

Vallano M. L., 457
Varastet M., 47
Vaughn J. E., 1117
Verkhratsky A., 381
Vincent S. R., 223
Voisin D. L., 547
Vrbová G., 327

Wagner J. A., 679
Walkinshaw G., 1, 881, 975
Waters C. M., 1, 881, 975
Weihe E., 249, 313
Weiner I., 363
Westergren I., 1057
Westlake T. M., 637
Wetts R., 1117
Whitton P. S., 945
Wiesel F.-A., 1003
Wiesenfeld-Hallin Z., 817
Wiley R. G., 95
Wilkinson L. S., 95
Will B., 19, 41
Windhorst U., 747
Winkler H., 1179
Wong T. M., 267

Xu X.-J., 817

Yanagihara T., 957
You Z.-B., 415, 427
Young S. J., 711

Zagorodnyuk V., 1137
Zedlick D., 499
Zhang Y.-Z., 307
Zheng F., 295
Zhu P. J., 489
Zhuo H., 617

INTERNATIONAL BRAIN RESEARCH ORGANIZATION
World Federation of Neuroscientists
Incorporated as an independent international organization
Ottawa 1961

D. P. Purpura (U.S.A.)	*President*
M. Ito (Japan)	*Honorary President*
D. Ottoson (Sweden)	*Secretary-General*
B. A. Milner (Canada)	*Executive Secretary*
P. Strata (Italy)	*Treasurer*
P. Strata (Italy)	*Director, Workshop and Symposia Programme*
A. D. Smith (U.K.)	*Director, Publications Programme*
E. S. Vizi (Hungary)	*Director, Fellowships Programme*
C. Blakemore (U.K.)	*Managing Editor, IBRO News*

Secretary-General
Prof. D. Ottoson
51, Bd. de Montmorency
75016 Paris
France

Executive Secretary
Prof. B. A. Milner
Montreal Neurol. Inst.
3801, University St.
Montreal, Quebec,
Canada H3A 2B4

IBRO Secretariat
Executive Director
Ms Olga Popoff
51, Bd. de Montmorency
75016 Paris
France

IBRO NEUROSCIENCE CALENDAR

The International Brain Research Organization publishes a calendar of events in the neurosciences. It is hoped that the calendar, which is published in *IBRO News*, will help scientists in the field to plan ahead for the meetings they wish to attend. The aim of the calendar is to contain as many announcements as possible of forthcoming scientific meetings in the neurosciences throughout the whole world. It is in a form suitable for mounting on a wall.

IBRO invites organizers of meetings to send information on their meetings, together with a statement as to whether the date is definite or provisional, to: Office of *IBRO News*, University Laboratory of Physiology, Parks Road, Oxford OX1 3PT, U.K.

PRINTED IN ENGLAND BY BPC WHEATONS LTD, EXETER